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OFHEO'S RISK-BASED CAPITAL STRESS TEST

Incorporating New Business Is Not Advisable



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Contents

Letter		1
Results in Brief		2
Background		3
New Business Has a Substantial Impact on the Enterprises'		
Financial Health, Level of Risks, and Capital Adequacy		6
Incorporating New Business Assumptions Is Difficult and		
Inherently Speculative		10
Supervisory Review Can Be Another Effective Tool for Limiting the		
Potential Risks of New Business		16
Conclusions		18
Recommendation		19
Agency Comments and Our Evaluation		19
Appendix I	HUD Regulates the Enterprises' Housing Goal Requirements	22
Appendix II	The Business of the Enterprises	24
Appendix III	Comments from Freddie Mac	26
Related GAO Products		27
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Tables		
Table 1: Enterprise Purchases of Single-Family Mortgages		
Compared with Originations and the Prior Year's Mortgage		
Portfolio, 1991-2000		7
Table 2: Selected Enterprise On-Balance Sheet Holdings and		
Liabilities as of December 31, 2001		24
Table 3: Total Mortgage Portfolio of the Enterprises, Year-End 2001		24
Table 4: Selected Data on Enterprise Income and Expenses for the		
year ending December 31, 2001		25

Abbreviations

HUD	Department of Housing and Urban Development
MBS	mortgage-backed securities
FCA	Farm Credit Administration
FHFB	Federal Housing Finance Board
FHLBank	Federal Home Loan Bank
GSE	Government-Sponsored Enterprise
OFHEO	Office of Federal Housing Enterprise Oversight
PCA	Prompt Corrective Actions



United States General Accounting Office
Washington, DC 20548

June 28, 2002

Congressional Committees:

This report responds to a mandate in the Federal Housing Enterprises Financial Safety and Soundness Act of 1992 (the act)¹ that we study whether the Office of Federal Housing Enterprise Oversight (OFHEO) should incorporate new business assumptions into the stress test used to establish risk-based capital requirements. The stress test is designed to estimate, for a 10-year period, how much capital the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac) would be required to hold to withstand potential economic shocks, such as sharp movements in interest rates or adverse credit conditions.² Incorporating new business assumptions into the stress test would mean specifying details about the types and quality of new mortgages that would be acquired during the 10-year stress period, the types of funding that would be used to acquire such mortgages, and other operating and financial strategies that would be implemented by Fannie Mae's and Freddie Mac's (the enterprises) managements. Under the terms of the act, the current test assumes that the enterprises do not contract for any new business beyond what is on the books at the time of the test. OFHEO issued its risk-based capital rule on September 13, 2001.³ Four years after issuing its risk-based capital rule, OFHEO has the option to incorporate new business assumptions into the test. Our mandate is to provide, within the first year after the rule is issued, an opinion on the advisability of including new business after the initial 4-year period.⁴

As agreed with your offices, our objectives were to (1) analyze the effects that new business could have on the enterprises' financial condition and capital adequacy; (2) analyze the challenges of incorporating new business assumptions into the stress test, including any potentially adverse consequences; and (3) consider the efficacy of using supervisory review in

¹P. L. No. 102-550, title XIII (1992). The mandate is codified at 12 U.S.C. § 4611 (a)(3)(C) (2000).

²The level of risk-based capital a regulated institution is required to hold is based on potential losses the institution faces as a result of its activities.

³12 C.F.R. part 1750 (2002).

⁴The Congressional Budget is also required to submit an opinion.

conjunction with the current stress test to address the potential risks associated with new business.

To complete our work, we reviewed (1) the 1992 act and its legislative history; (2) enterprise capitalization studies conducted by the Department of Housing and Urban Development (HUD) prior to OFHEO's establishment; (3) OFHEO's current risk-based capital regulation and public comments made on previously proposed risk-based capital rules; (4) historic financial data pertaining to the balance sheets and new business activities of the enterprises; (5) each enterprise's risk-management practices and financial models used for planning and risk-management purposes; and (6) related literature. We did not verify financial data on the enterprises or provided by OFHEO, nor did we review the mechanics of the OFHEO stress test model. We also interviewed officials from the enterprises, HUD, OFHEO, and rating agencies, as well as individuals engaged in developing risk-based capital models for financial institutions. Our scope was limited to our study mandate and its focus on new business assumptions, so we did not make an overall evaluation of OFHEO's current risk-based capital rule or stress test, except as they directly applied to our study mandate.

We conducted our work in Washington, D.C., between September 2001 and April 2002, in accordance with generally accepted government auditing standards.

Results in Brief

New business is an important determinant of the expected future financial condition of both Fannie Mae and Freddie Mac. Data for the enterprises show that new business conducted over a 10-year period generally accounts for a large share of their on- and off-balance sheet holdings of assets and liabilities at the end of each 10-year period. Because new business represents such a large share of enterprise holdings over time, it would have a major impact on the enterprises' financial condition, risks, and capital adequacy in the face of stressful events.

However, determining the appropriate new business assumptions to include in OFHEO's model would be difficult and inherently speculative. To incorporate new business assumptions, OFHEO would have to develop plausible scenarios for how enterprise management and the market would respond in a stressful environment. For instance, OFHEO would need to consider management's capacity, not only to make appropriate adjustments in the face of uncertainty but, it would also have to make assumptions about actions the enterprises might take to improve their

financial condition. Another factor to consider would be HUD's regulatory behavior during periods of stress, because the Secretary of HUD has exclusive authority to promulgate and enforce numeric housing goals for the enterprises. The fact that the enterprises do not incorporate new business assumptions into their own long-term capital adequacy models illustrates the difficulties involved. The enterprises generally incorporate new business assumptions only into financial models for relatively short-term planning (4 years or less). In addition, incorporating new business assumptions would increase the complexity of OFHEO's already complex stress test, making it more difficult to understand and replicate. Because of the importance of new business and the speculative nature of any assumptions about enterprise behavior, the assumptions required could dominate the capital requirement.

OFHEO has another tool it can use to limit risk taking by the enterprises. Supervisory review, which includes examination of the enterprises' ongoing business activities and enforcement actions, should work in conjunction with the capital requirement to help ensure the safety and soundness of the enterprises. OFHEO is authorized to take actions to limit risk taking when an enterprise's financial condition is jeopardized. Financial regulators tend to rely on supervisory review to respond when specific practices occur that could pose a safety and soundness concern.

This report contains a recommendation to the director of OFHEO that the agency not incorporate new business assumptions into its stress test, because determining the assumptions is inherently speculative and including them would introduce more complexity to an already complex model.

Background

Congress established and chartered the enterprises—Fannie Mae and Freddie Mac—as government-sponsored enterprises (GSE) that are privately owned and operated. Their mission is to enhance the availability of mortgage credit across the nation during both good and bad economic times by purchasing mortgages from lenders (banks, thrifts, and mortgage bankers) that use the proceeds to make additional mortgage loans to home buyers. The enterprises issue debt to finance some of the mortgage assets they retain in their portfolios. Most mortgages purchased by the enterprises are conventional mortgages, which have no federal insurance

or guarantees. Enterprise purchases are subject to a conforming loan limit⁵ that currently stands at \$300,700 for a single-unit home.

The debt and mortgage assets in the enterprises' portfolios are on-balance sheet obligations (liabilities) and assets, respectively. A majority of the mortgages, however, are placed in mortgage pools to support mortgage-backed securities (MBS) that may be sold to investors or repurchased by the enterprises and held in their portfolios. MBS are conduits for collecting principal and interest payments from mortgages in the mortgage pools and passing payments onto MBS investors. The enterprises charge fees for guaranteeing the timely payment of principal and interest on MBS held by investors. MBS held by investors other than the enterprises are off-balance sheet obligations of the enterprises.

The federal government's creation of and continued relationship with Fannie Mae and Freddie Mac have created the perception in financial markets that the government will not allow the enterprises to default on their debt and MBS obligations, although no such legal requirement exists. As a result, Fannie Mae and Freddie Mac can borrow money in the capital markets at lower interest rates than comparably creditworthy private corporations that do not enjoy federal sponsorship. At least a portion of the financial benefits that accrue to the enterprises have been passed along to homeowners in the form of lower mortgage interest rates.

During the 1980s, the government did provide limited regulatory and financial relief to Fannie Mae when the enterprise was experiencing significant financial difficulties; and in 1987, Congress authorized \$4 billion to bail out the Farm Credit System, another GSE. Recognizing the potentially large costs that Fannie Mae and Freddie Mac pose to taxpayers, Congress passed the act, which established OFHEO as an independent regulator within HUD—tasked with ensuring the enterprises' safety and soundness. OFHEO's director has broad independent authority to ensure that OFHEO fulfills its safety and soundness mission. For example, the director has the authority to take supervisory and enforcement actions regarding the safety and soundness of the enterprises without the review and approval of the Secretary of HUD.

⁵The enterprises' charters restrict them to buying mortgages that do not exceed a set dollar amount. This ceiling is known as the conforming loan limit.

The act requires OFHEO to carry out its oversight function both by establishing and enforcing minimum capital standards (including the risk-based capital standard) and by conducting annual on-site safety and soundness examinations of the enterprises to assess their operations and financial condition. The act established the broad outlines of a stress test and mandated that OFHEO develop its stress test within those parameters to serve as the basis for the risk-based capital standards.⁶ The act requires the stress test to simulate situations that expose the enterprises to extremely adverse credit and interest rate scenarios over a 10-year period and to calculate the cash flows and the amount of capital the enterprises would need to continue to operate for the entire period. The stress test model must include upward and downward interest rate movements of up to 6 percentage points and assume a high level of credit risk (based on the worst cumulative credit loss for not less than 2 consecutive years in contiguous states encompassing at least 5 percent of the U.S. population). As required in the act, the stress test model that the agency developed estimates credit⁷ and interest rate⁸ risks, among other factors, and includes an additional 30 percent of that amount for management and operations risk.⁹ Also as required, it does not include new business assumptions. The act set a December 1, 1994, deadline for completion of the stress test and risk-based capital standards.

HUD is the mission regulator of the enterprises. The Secretary of HUD has general regulatory power over the enterprises to ensure that they carry out their mission as stated in their charters. The act requires the Secretary to establish annual goals for purchases of mortgages on low- and moderate-income housing, special affordable housing, and housing in central cities, rural areas, and other under-served areas. When HUD establishes housing goals, it must look at several factors, including the need for the enterprises to remain in sound financial condition. For more information about HUD's mission regulation, see appendix I.

⁶For financial purposes, capital is generally defined as the long-term funding for a firm that cushions the firm against unexpected losses.

⁷Generally, credit risk is the risk of loss that arises when borrowers fail to repay their loans, other parties fail to meet their obligations to administer or guarantee loans, or both.

⁸Generally, interest rate risk is the exposure to possible losses and changes in value arising from changes in interest rate.

⁹Generally, management and operations risk is the exposure to financial loss from inadequate systems, management failure, faulty controls, or human error.

New Business Has a Substantial Impact on the Enterprises' Financial Health, Level of Risks, and Capital Adequacy

The enterprises are in the business of buying and holding mortgages and insuring mortgage cash flows to investors. New business accounts for a large share of the enterprise's on- and off-balance sheet holdings and thus has a major impact on their activities and financial health. The financial health of the enterprises and their ability to survive a future stressful economic period depend on the level of risk in both their existing and new business; the amount of capital that is available to them to absorb any losses—their capital adequacy; and the business decisions they make during the stressful period.

New Business Affects the Enterprises' Financial Condition

The enterprises continually acquire mortgages originated by lenders for home purchases and for refinancing existing mortgages (see table 1). Such mortgage acquisitions are a large share of total originations in any year and are often large relative to mortgage holdings at the end of the prior year. For example, the enterprises' purchases equaled between 32 and 51 percent of total single-family originations in each year between 1991 and 2000.¹⁰ In addition, their yearly purchases between 1991 and 2000 ranged from about 17 to 51 percent of their total mortgage portfolios in the prior year.¹¹

¹⁰ Due to data limitations, we compared enterprise purchases with total single-family originations.

¹¹ An enterprise's total mortgage portfolio includes on-balance mortgage assets plus off-balance sheet MBS held by investors. MBS issuance moves mortgage assets and associated interest-rate risk off the enterprise's balance sheet unless the enterprise repurchases the securities.

Table 1: Enterprise Purchases of Single-Family Mortgages Compared with Originations and the Prior Year's Mortgage Portfolio, 1991-2000

Dollars in millions					
Year	Total enterprise purchases	Total originations	Enterprise purchases as a percentage of originations	Prior year's total enterprise mortgage portfolios	Enterprise purchases as a percentage of prior year's portfolios
1991	\$233,280	\$562,074	41.50	\$740,020	31.52
1992	439,309	893,666	49.16	867,793	50.62
1993	518,877	1,019,861	50.88	1,021,847	50.78
1994	280,792	773,121	36.32	1,156,442	24.28
1995	215,974	639,436	33.78	1,240,987	17.40
1996	287,306	785,329	36.58	1,332,849	21.56
1997	275,081	859,100	32.02	1,445,591	19.03
1998	618,410	1,470,000	42.07	1,536,258	40.25
1999	548,748	1,275,000	43.04	1,786,598	30.71
2000	395,082	1,048,000	37.70	2,062,943	19.15

Source: OFHEO.

At the end of 2001, Fannie Mae's total mortgage portfolio was \$1.56 trillion and Freddie Mac's \$1.14 trillion, of which \$705 billion and \$492 billion, respectively, represented on-balance sheet mortgages. For more information about the financial performance of the enterprises, see appendix II.

New Business Affects the Enterprises' Level of Risk

The enterprises face two primary risks, which are modeled in OFHEO's stress test: interest rate risk and credit risk. The degree of risk depends on the enterprises' operating and managerial decisions as well as on future economic factors such as interest rates, unemployment, inflation, and economic growth. Although the enterprises can take risk-management efforts to limit their exposure, the costs of these efforts can reduce profits. Thus, risk management is usually associated with both a lower expected or average profit and reduced variability in profits and losses.

Effects of Interest Rate Risk

Interest rate risk reflects both movements in interest rates and management decisions about how to fund mortgage acquisitions. In general for the enterprises, when market interest rates decline, mortgage purchases increase as homeowners move and pay off or refinance existing mortgages. Declining rates may also lower the enterprises' funding costs. In contrast, rising market interest rates create higher interest expenses for the enterprises as debt turns over. Prolonged periods of rising interest rates typically lead to a slowdown in prepayments and refinancing activity, because interest rates on new mortgages are higher than those on most of

the previously originated mortgages. If funding costs rise and existing on-balance sheet mortgages at old, lower interest rates remain on the books, prolonged periods of losses and capital erosion can occur. Enterprise management can use callable debt¹² and other financial instruments or strategies to mitigate interest rate risk and other potential losses. However, such managerial decisions will tend to lower future expected profits.

OFHEO's current stress test, which assumes no new business over a 10-year period, simulates the impact of interest rate movements and economic conditions on the behavior of borrowers whose mortgages are held by the enterprises and therefore affect the enterprises' cash flows. The model requires that the mortgage holdings wind down over the 10-year period. The extent to which existing business winds down shows the importance of new business, because in practice the enterprises would be acquiring new mortgages to replace lost mortgages during the period.

In the stress test model, the remaining mortgage balance (and existing business) depends on scheduled payments of principal, other prepayments, and defaults. Prepayments are sensitive to interest rate changes because lower rates accelerate prepayments and higher rates depress them. Default losses are sensitive to economic conditions, including loan-to-value ratios and seasoning,¹³ because loans with lower loan-to-value ratios and seasoned loans are less likely to default.

OFHEO ran its model for us for a portfolio of newly originated 30-year fixed-rate single-family mortgages¹⁴ with 95 percent loan-to-value ratios. About 4.7 percent of a portfolio of newly originated loans would still be on the enterprises' books after 10 years in the declining interest rate environment mandated by the act. In the increasing rate environment mandated by the act, about 57.3 percent of a portfolio of newly originated

¹²Callable debt refers to financial debt instruments, such as bonds, that are redeemable by the issuer before the scheduled maturity. The issuer must pay the holders a premium price if such a security is retired early. Bonds are usually called when interest rates fall so significantly that the issuer can save money by floating new bonds at lower rates.

¹³The act defines seasoning as "the change over time in the ratio of the unpaid principal balance of a mortgage to the value of the property by which such mortgage loan is secured." 12 U.S.C. § 4611 (d)(1) (2000).

¹⁴A single-family mortgage loan finances a one- to four-unit residential property; multifamily loans finance properties with five or more housing units.

loans would still be on the enterprises' books after 10 years.¹⁵ OFHEO also ran the model on other portfolios with different loan-to-value ratios and degrees of seasoning, with similar results in both the declining and increasing rate environments. As previously stated, in actual practice the enterprises would replace many of the lost loans; and the types of mortgages acquired and types of financial instruments actually used to fund these new mortgages would significantly impact returns and risks.

Effects of Credit Risk

Credit risk reflects both economic conditions and management decisions about mortgage acquisitions. Deteriorating economic conditions can lower home values and reduce homeowners' incomes, therefore increasing credit risk. Likewise, management decisions to increase loan-to-value ratios or otherwise ease underwriting standards can raise credit risk.

The OFHEO simulations also showed how the credit stresses in the mandated increasing and decreasing rate environments could affect credit-related losses. The simulations showed that, for a portfolio of newly originated single-family mortgages with a 95 percent loan-to-value ratio, defaults would account for a decline of about 19.5 percent of the original mortgage balances in the decreasing rate environment and a decline of about 16.2 percent of the original mortgage balances in the increasing rate environment.

The enterprises could limit credit risk in several ways. For example, they could use more stringent underwriting standards, although such standards could limit the dollar volume of mortgages they are able to purchase and possibly affect their ability to support the residential mortgage market. For instance, requiring homeowners to make large down payments or purchase private mortgage insurance could make acquiring a mortgage more difficult for potential homeowners. Second, they could more aggressively monitor loans and work out problems with troubled loans. Third, the enterprises could mitigate the economic costs of defaults by raising the management guarantee fee they charge mortgage pools for providing credit insurance and managing the pools. Ultimately, however, management actions to limit credit risk might create expenses that would curtail expected future profits. Actual decisions about underwriting, mortgage monitoring, and guarantee fees would affect the returns and risks associated with the acquisition of new mortgages by the enterprises.

¹⁵Part of this decline in mortgage balances is the result of factors such as defaults.

New Business Affects the Enterprises' Capital Adequacy

Under the risk-based capital test, capital adequacy measures the amount of capital an enterprise needs to ensure that it can continue to operate during a stressful period and is based on expected profits and the risks taken to generate those profits. Generally speaking, risk and profit are positively related. For example, an enterprise can increase its expected profits by taking more risks, but taking greater risks can increase the possibility that the enterprise will not survive a stressful economic period due to losses incurred. An enterprise can increase its chances of surviving a stressful period by increasing its capital level, but such increases raise funding costs and reduce future expected profits. Capital adequacy also depends on the extent and duration of the economic stress that the enterprise might encounter. The greater the levels of stress an enterprise must endure and the longer the exposure to stress, the less likely it is that the enterprise will survive the stress period with a given level of capital.

Incorporating New Business Assumptions Is Difficult and Inherently Speculative

Incorporating new business assumptions into long-term financial planning models is difficult, primarily because doing so is inherently speculative. Incorporating such assumptions would require OFHEO to develop plausible scenarios for the future behavior of the enterprises—for example, the types of mortgages they might acquire, their future funding strategies, and other managerial decisions. In addition, OFHEO would have to consider HUD's regulatory actions and their effect on the enterprises during the stress period. The difficulty of incorporating new business assumptions into a stress test is reflected in the fact that the enterprises do not include such assumptions in their own long-term capital adequacy models. The enterprises generally use new business assumptions only in models with relatively short time frames (up to 4 years). Finally, OFHEO's stress test is already highly complex. Adding new business assumptions would increase its complexity and make the legal requirement that it be replicable more difficult to meet.

OFHEO's Assumptions about the Behavior of Management Would Be Speculative

An OFHEO stress test with new business assumptions would have to include explicit assumptions about the enterprises' strategic managerial behavior in a stressful economic environment. Management's behavior would have to be linked to hedging, which affects interest rate risk; underwriting, which affects credit risk; and setting guarantee fees, which affect earnings. Specifying management's behavior would be speculative, unlike the modeling of borrowers' behavior in the stress test. Borrowers' behavior related to mortgage prepayment and default can be and is predicted in the stress test, based on statistical techniques that are applied to historic data. Although this prediction is subject to statistical

measurement errors, these techniques can be used to extrapolate borrower behavior in a stressful environment. However, because managerial behavior is idiosyncratic, such techniques cannot be used to extrapolate managerial behavior in a stressful environment from behavior in more normal economic environments. For instance, overall management strategies dealing with both interest rate and credit risks could either exacerbate risk exposures or mitigate such risks to various degrees. OFHEO would lack criteria, both statistical and theoretical, to justify assumptions about these strategies. Therefore, OFHEO would have to speculate about managerial behavior to develop new business assumptions. In addition, because a significant proportion of the enterprises' mortgages either prepay or default over a 10-year period and are replaced by new business, the assumptions about new business could easily dominate the cash and capital flows in the stress test over the 10-year period. These assumptions could also determine whether the enterprises met or failed to meet the risk-based capital requirement.

In the legislative history of the act, Congress recognized that OFHEO would have to hypothesize about any new business assumptions that might be included in a stress test. Language in a Senate committee report explicitly recognized that incorporating new business assumptions during a stressful period would require speculating about enterprise behavior. The report recognized that any assumptions addressing new business in the stress test would also have to incorporate further assumptions about enterprise management's capacity to make suitable adjustments.¹⁶

The act requires the director to assume that the new business the enterprises conduct during the stress period will be consistent with either historic or recent experience and with the economic characteristics of the stress period. In particular, the director must make specific assumptions about five factors:

- the amounts and types of business,
- losses,
- pricing,
- interest rate risk, and
- reserves.

¹⁶S. Rep. No. 102-282 at 22 (1992).

OFHEO Would Need to Consider HUD's Regulatory Response to the Enterprises' Housing Goals

These restrictions limit OFHEO's modeling assumptions, allowing for managerial response only after the advent of the stressful condition and requiring that the responses be consistent with the prior behavior of the enterprise. In other words, for purposes of the stress test OFHEO cannot assume that management will take actions in anticipation of stressful conditions, that management will be able to respond differently than it has previously under similar circumstances, or that management will respond promptly and effectively to stressful situations to maintain adequate capital.

In addition to speculating about the behavior of the enterprises' management, OFHEO would need to consider HUD's regulatory response to a stressful environment. HUD regulates the enterprises in terms of housing goals and other charter requirements not directly concerned with safety and soundness (see app. I for a detailed description of HUD's regulatory responsibilities and powers).¹⁷ However, when HUD establishes housing goals, it must look at several factors, including the need for the enterprises to remain in sound financial condition.

If either enterprise's financial condition should falter, the Secretary of HUD would likely take regulatory actions to help the enterprise rather than allow it to withdraw entirely from the secondary mortgage market or from segments of the market governed by HUD's numeric goals. For modeling purposes, OFHEO would have to consider both the regulatory actions HUD might take to ensure that the enterprises continue to comply with the housing goals and the effects of such actions on management's approach to new business and risks. HUD's regulatory response could have a further effect on the model by constraining the enterprises and thus affecting managerial decisions at the enterprises.

¹⁷The act gave the Secretary of HUD exclusive authority to promulgate numeric housing goals for the enterprises and to monitor and enforce compliance with these goals.

New Business Assumptions Are Not Included in Fannie Mae's Long-Term Financial Modeling or Freddie Mac's Modeling for Capital Adequacy

The enterprises do not include new business in their long-term financial models (Fannie Mae) or in their capital adequacy models (Freddie Mac) because they believe that such assumptions would be speculative.¹⁸ Fannie Mae officials told us that it would not be reasonable to make new business assumptions beyond a window of several years, and the results of such a modeling approach might be more reflective of the assumptions themselves than of the actual risks faced by Fannie Mae. Freddie Mac's interest rate risk exposure is stated in terms of portfolio market value sensitivity, or the estimated percentage decline in Freddie Mac's market value of equity that results from a change in interest rates. Freddie Mac officials told us that another reason they do not include new business in their risk models is that they want to focus on the risks of the current book of business and not the profitability of new business. Although OFHEO probably would not rely solely on the enterprises' assumptions about new business, in the absence of such assumptions, OFHEO would still have to make plausible assumptions about the enterprises' behavior.

The enterprises do include new business assumptions in the short-term models used to manage business on a day-to-day basis and for planning. The enterprises' short-term planning models typically focus on business strategies during time periods of no more than 4 years under economic stresses that are relatively normal compared with those in OFHEO's stress test. Some of these models used to analyze interest rate risk include new business assumptions.

Other Entities Generally Do Not Incorporate New Business Assumptions When Evaluating Long-Term Capital Adequacy

Our review of information from regulators and three rating agencies (Standard & Poor's, Moody's, and Fitch) indicates that these entities do not use new business assumptions when evaluating the capital adequacy of financial institutions. For example, the Federal Housing Finance Board (FHFB) has issued risk-based capital standards for the other housing GSE, the Federal Home Loan Bank (FHLBank) System. FHFB developed an approach based on the existing balance sheet that estimates the market value of the FHLBank's portfolio at risk under financial stress scenarios and thus does not require an assumption about new business. As another example, depository institution regulators have established capital requirements for credit risk that assign all existing assets and off-balance sheet items to broad categories of relative risk; and they do not

¹⁸ Fannie Mae officials distinguish between long- and short-term models, with long-term models covering periods of more than 4 years. Freddie Mac officials distinguish between capital adequacy (or risk) models and models used to manage day-to-day business (and for planning).

incorporate new business assumptions. In addition, Standard & Poor's, Moody's, and Fitch use no new business in their stress tests for rating private mortgage insurers.¹⁹

During our review, we identified one instance in which new business assumptions are included in a risk-based capital stress test. The Farm Credit Administration (FCA) has established risk-based capital standards for Farmer Mac, a relatively small GSE operating in the secondary market for agricultural mortgages. FCA includes replacement of paid-off agricultural mortgages in its 10-year stress test model.²⁰

Including New Business Assumptions Would Add Complexity to OFHEO's Stress Test and Make It Difficult to Replicate

The unique nature of OFHEO's risk-based standard, particularly the 10-year time frame and the specificity regarding stresses, makes the OFHEO stress test complex. Adding new business assumptions would increase this complexity by introducing more factors that could affect the behaviors modeled within the stress test and requiring that more behaviors be modeled.²¹ Adding more complexity would further limit the ability of analysts and others to understand and replicate the test, as the 1992 act requires.²² For example, the test would likely require refinements to take into account the dynamic behaviors of borrowers, investors in enterprise debt and MBS, and the enterprises over the 10-year period. These behaviors include shifts in borrower demand for fixed- and adjustable-rate mortgages, investors' willingness to take on the risk of alternative funding sources for the enterprises, and the enterprises' mortgage purchase and funding strategies. According to enterprise officials, the ability of individuals outside of OFHEO to understand and replicate the current stress test is already strained, even without new business assumptions. The inclusion of new business assumptions to predict the behaviors of

¹⁹The enterprises face credit risks that are similar to those faced by private mortgage insurance companies.

²⁰Requirements for the test can be found at 12 C.F.R. part 650 (2002). We did not evaluate FCA's stress test.

²¹Under the act, the director of OFHEO, among other considerations, is required to ensure that the regulations "shall contain specific requirements, definitions, methods, variables and parameters used under the risk-based capital test and in implementing the test (such as loan loss severity, float income, loan-to-value ratios, taxes, yield curve slopes, default experience, and prepayment rates)." 12 U.S.C. § 4611 (e)(2) (2000).

²²The act requires OFHEO's risk-based capital regulations to be "sufficiently specific to permit an individual other than the director to apply the test in the same manner as (OFHEO)." 12 U.S.C. § 4611 (e)(2) (2000).

parties such as the mortgage originators, mortgage borrowers, investors, and the enterprises would exacerbate this situation.

New Business Assumptions Could Dominate the Capital Requirement Under the Stress Test

To incorporate new business assumptions into its stress test, OFHEO could develop plausible scenarios for how enterprise management and the market might respond in a stressful environment, but depending on the assumptions, the capital requirement could be increased or decreased. The assumptions could dominate the capital requirement. In the early 1990s, for example, prior to the creation of OFHEO, HUD analyzed each enterprise's capitalization using a stress test that incorporated a Depression scenario.²³ HUD's analyses showed that incorporating new business resulted in higher capital requirements for the enterprises. HUD made two major assumptions that affected the result. First, HUD assumed that the enterprises would have difficulty determining exactly when a downturn would begin and projecting its length and severity. This assumption limited management's ability to mitigate risk. Second, HUD assumed that the enterprises would be required to provide ongoing and meaningful support to the secondary mortgage market during a prolonged period of severe economic conditions; and therefore, the enterprises could not stop purchasing mortgages that might generate losses in a stressful environment.

Other plausible scenarios could lead to assumptions showing that incorporating new business might mitigate risk and improve capital adequacy. According to Fannie Mae officials, for example, including new business using the enterprises' current underwriting standards and guarantee fees would result in a lower capital requirement. The officials pointed out that in a falling interest rate environment, the credit quality of an existing mortgage portfolio would typically decline as the less risky mortgages are refinanced and the more risky ones remain. Including new business that encompasses the newly refinanced mortgages would lower credit risk and thus result in a lower capital requirement. An alternative plausible set of assumptions showing that incorporating new business might mitigate risk and improve capital adequacy could presume that the enterprises would change their business practices to reduce risks in a stressful environment. For example, during a stressful period, the

²³*Capitalization Study of the Federal National Mortgage Association and the Federal Home Loan Mortgage Corporation* (November 1991); *1991 Report to Congress on the Federal Home Loan Mortgage Corporation* (December 1992); *1991 Report to Congress on the Federal National Mortgage Association* (December 1992).

enterprises might implement stricter underwriting standards and increase their guarantee fees in reaction to possible declines in mortgage credit quality.

Supervisory Review Can Be Another Effective Tool for Limiting the Potential Risks of New Business

While OFHEO's risk-based capital requirement is a key element in ensuring the enterprises' financial safety and soundness, other mechanisms also exist to limit risk taking by the enterprises. The proposed Basle Accord revisions, which address banking supervision, list the three "mutually reinforcing pillars" that help ensure the financial safety and soundness of banks. These pillars—risk-based capital requirements (discussed in this report), market discipline, and supervisory review—should also be used to address safety and soundness oversight of the enterprises. Based on our work on bank and GSE safety and soundness supervision and our review of the proposed Basle Accord revisions, we have concluded that capital regulation in isolation does not provide sufficient oversight.

Market discipline can curb risky behavior by the enterprises to the extent that the enterprises' customers and creditors will demand that the enterprises stay fiscally strong in order to fulfill their obligations. Market discipline works best when firms fully and publicly disclose their financial conditions. Customers and creditors can then use the information to determine further interactions with the enterprises. In October 2000, the enterprises adopted six voluntary commitments aimed at increasing their disclosures. The commitments included, among other things, the issuance of subordinated debt and public disclosure of financial information. Enterprise officials stated that these commitments would improve transparency and market discipline because market participants could use the added information to better assess the financial condition of the enterprises. We acknowledge that financial disclosure as mandated by the voluntary accord may improve transparency. However, its impact on the enterprises and their customers or funding parties is limited if the enterprises are perceived to have implicit government backing. That is, other economic parties may believe that the federal government will ensure that the enterprises continue to operate and to perform satisfactorily on financial contracts such as loans and mortgage purchases. For this reason, while market discipline can play a role in curbing risky behavior by the enterprises, it also has its limitations. Supervisory review thus takes on more importance as a means for limiting inappropriate risk-taking behavior by the enterprises.

The proposed revision of the Basle Accord recognizes the supervisory review process as one of three “pillars” that contribute to safety and soundness in the financial system. OFHEO’s supervisory review includes examining the operations of the enterprises and taking the supervisory and enforcement actions necessary to ensure that the enterprises are operating safely and soundly. In conjunction with other elements of supervision, supervisory review can also help ensure that the enterprises maintain sufficient capital to support the risks they undertake. Further, it can encourage the enterprises to develop and use better risk-management techniques to address the risks associated with both existing and new business. Supervisory review can focus on internal approaches to capital allocation and internal assessments that reflect management’s own expectations about future business opportunities and risks without the need for OFHEO to impose its own assumptions about new business.

In addition, supervisory review allows OFHEO to address the enterprises’ management structure and business approaches to ensure that risk-management techniques and internal controls are appropriate and are protecting the public interest. Risk-management practices that sufficiently limit the credit and interest rate risks associated with new business and adequate OFHEO supervision of those practices can reduce the chances that an enterprise will take on risky new business that could jeopardize its capital adequacy in a stressful economic environment. For example, adequate supervision could inhibit an enterprise’s attempt to “grow” its way out of a problem situation in a stressful environment by means such as lowering underwriting standards or relaxing risk-management controls that address interest rate risk. While adequate supervision is not guaranteed by the presence of OFHEO and its legal authorities, inclusion of speculative new business assumptions in the stress test—based on plausible managerial behavior—would not reduce the importance of adequate supervision.

OFHEO has several legal authorities that help in carrying out supervisory responsibilities relating to safety and soundness. These authorities include informal supervisory actions; formal enforcement actions involving notice to the affected enterprise; hearing opportunities; and, if warranted, imposition of sanctions such as cease and desist orders or civil monetary penalties. The Federal Deposit Insurance Corporation Improvement Act of 1991 mandates actions, known as prompt corrective actions (PCA), that depository institution regulators must take in response to specific

capitalization levels. Similarly, the 1992 act contains PCA provisions that authorize and, depending on the level of undercapitalization, require OFHEO to take certain actions when an enterprise is undercapitalized.²⁴ These mandates, which specify actions to be taken at certain levels of undercapitalization, limit the possibility that OFHEO might be lenient once an enterprise's capital cushion is impaired. OFHEO has issued regulations implementing the PCA provisions and establishing prompt supervisory responses to be taken based on specified noncapital developments.²⁵ The director of OFHEO has broad discretion over measures that can be taken beyond these required actions. Such discretionary powers allow the director of OFHEO to respond when specific enterprise practices occur that could pose a safety and soundness concern.

Conclusions

Determining new business assumptions for inclusion in OFHEO's stress test is inherently speculative, and OFHEO would have to develop plausible scenarios for managerial behavior to make such a determination. The assumptions about new business could easily dominate the cash and capital flows over the 10-year stress test period and therefore dominate the capital requirement. Thus, these assumptions could also determine whether the enterprises met or failed to meet the risk-based capital requirement. Adding new business assumptions would introduce more complexity to an already complex model and interfere with the public policy mandate that requires the model to be understandable and replicable. A stress test that concentrates on existing business rather than potential new business allows all parties to observe the risks embedded in current holdings and operations. In addition, OFHEO can use supervisory review in conjunction with the stress test to help limit the potential risks associated with new business.

²⁴See U.S. General Accounting Office, *Comparison of Financial Institution Regulators' Enforcement and Prompt Corrective Action Authorities*, GAO-01-322R (Washington, D.C.: Jan. 31, 2001). Unlike other depository institution regulators, OFHEO lacks the authority to remove officers and directors, place an enterprise into receivership, or bring suit on the agency's behalf (OFHEO must rely on the Attorney General).

²⁵On January 25, 2002, OFHEO published regulations on prompt supervisory response and corrective action. The regulations contain the procedures under which OFHEO is to take prompt corrective action in response to specified declines in enterprise capital levels and contains a system of prompt supervisory responses to be taken when specified developments internal or external to an enterprise warrant special supervisory review. 67 Fed. Reg. 3587 (Jan. 25, 2002).

Recommendation

OFHEO should not incorporate new business assumptions into its risk-based capital stress test. Appropriate examination and supervisory review by the regulator can help ensure that the enterprises maintain capital appropriate to the financial stresses they are experiencing with regard to new business.

Agency Comments and Our Evaluation

We requested comments on a draft of this report from the heads, or their designees, of Freddie Mac, Fannie Mae, and OFHEO. Freddie Mac's written comments, which agreed with our conclusions and recommendation, appear in appendix III. Fannie Mae and OFHEO provided technical comments that were incorporated where appropriate. OFHEO officials also stated that OFHEO does not model or predict enterprise behavior in its current stress test, but does make assumptions to project enterprise behavior in a stylized way, consistent with the stress conditions. For example, they cited assumptions about enterprise new debt issues and operating expenses in the current stress test. Such assumptions, they stated, are necessary for a capital requirement that is appropriately sensitive to risk. The OFHEO officials stated that incorporating new business into the stress test would entail making assumptions that address additional complicated managerial decisions on the full range of enterprise activities. They added that, in contrast to the assumptions that project managerial behavior in the current stress test, the assumptions necessary to incorporate new business have the potential to unduly influence the capital requirement and make it less sensitive to current risks.

We made revisions based on OFHEO's comments distinguishing between modeling or predicting enterprise behavior and developing reasonable assumptions for enterprise management. We agree with OFHEO officials that, compared to the current stress test, incorporating new business into the stress test would require assumptions that address additional complicated managerial decisions on the full range of enterprise activities. Our report notes, in particular, that the assumptions required to incorporate new business could dominate the capital requirement.

We will send copies of this report to the Director of OFHEO, the Chief Executive Officer of Fannie Mae, and the Chief Executive Officer of Freddie Mac. We will also make copies available to others upon request.

Please contact William Shear or me at (202) 512-8678 if you or your staff have any questions concerning this report. Key contributors to this report were Mitchell Rachlis, Darleen Wall, Paul Thompson, and Emily Chalmers.

A handwritten signature in black ink that reads "Thomas J. McCool". The signature is fluid and cursive, with "Thomas" on the top line, "J." in a smaller circle, and "McCool" on the bottom line.

Thomas J. McCool
Managing Director
Financial Markets and
Community Investment

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Chairman
The Honorable Phil Gramm
Ranking Minority Member
Committee on Banking, Housing,
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United States Senate

The Honorable Michael G. Oxley
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The Honorable John J. LaFalce
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Committee on Financial Services
House of Representatives

The Honorable Richard Baker
Chairman
The Honorable Paul Kanjorski
Ranking Minority Member
Subcommittee on Capital Markets, Insurance,
and Government Sponsored Enterprises
Committee on Financial Services
House of Representatives

Appendix I: HUD Regulates the Enterprises' Housing Goal Requirements

Except for matters under the Office of Federal Housing Enterprise Oversight's (OFHEO) exclusive authority, which relate primarily to enterprise safety and soundness, the Secretary of the Department of Housing and Urban Development (HUD) has general regulatory power over the enterprises to ensure that they carry out the purposes of their charters.¹ These purposes include (1) providing ongoing assistance to the secondary market for residential mortgages allowing for mortgages on housing for low- and moderate-income families involving lower returns than those earned on other activities and (2) promoting access to mortgage credit throughout the nation, including in central cities, rural areas, and underserved areas. Moreover, the act requires the Secretary to establish annual goals for the enterprises' purchases of mortgages on low- and moderate-income housing; special affordable housing (housing for low-income families in low-income areas and for very low-income families); and housing in central cities, rural areas and other underserved areas.² Based on the regulatory scheme established in the act, the Secretary of HUD could exercise these authorities during a stressful period in a way that might affect an enterprise's new business. For example, housing goals would require an enterprise to conduct new business. Forecasting these goals and the potential for other mission-related requirements and their impact on new business would be speculative.

The charter for each enterprise states that the purpose of the enterprise is

- to provide stability in the secondary market for residential mortgages;
- to respond appropriately to the private capital market;
- to provide ongoing assistance to the secondary market for residential mortgages (including activities relating to mortgages on housing for low- and moderate-income families, involving a reasonable economic return that may be less than the return earned on other activities) by increasing the liquidity of mortgage investments and improving the distribution of investment capital available for residential mortgage financing; and

¹The act directs the Secretary to exercise this authority by issuing the rules and regulations necessary and proper to ensure that the purposes of the enterprises' charter acts are accomplished. 12 U.S.C. § 4541 (2000).

²Federal Housing Enterprises Financial Safety and Soundness Act of 1992, P. L. No. 102-550, title XIII, 106 stat. 3672, 3941. HUD currently has numeric goals in place for the years 2001 through 2003. For example, the low- and moderate-income goal is set at 50 percent of each enterprise's mortgage purchases, an increase from the 42-percent requirement set for the years 1997 through 1999.

- to promote access to mortgage credit throughout the nation (including central cities, rural areas, and underserved areas) by increasing the liquidity of mortgage investments and improving the distribution of investment capital available for residential mortgage financing.

The numeric goals provisions of the 1992 act require the Secretary to consider the following factors in setting final housing goals for each of the three categories of housing: (1) national housing needs; (2) economic, housing, and demographic conditions; (3) the performance and effort of the enterprises in achieving the goals in previous years; (4) the size of the conventional mortgage market serving targeted borrowers relative to the size of the overall conventional mortgage market; (5) the ability of the enterprises to lead the industry in making mortgage credit available to targeted borrowers; and (6) the need to maintain the sound financial condition of the enterprises.

Although the last factor requires consideration of an enterprise's financial condition, nothing in the 1992 act suggests that the Secretary should refrain from establishing goals or taking other mission-related actions in the event of a stressful financial condition. However, we believe that the Secretary would not exercise mission and housing goal authorities in a way that would continue or increase an enterprise's financial stress, because doing so would undermine the financial safety and soundness requirements of the 1992 act and compromise the enterprise's ability to achieve its mission.³

³The act contains provisions authorizing, and in some circumstances requiring, OFHEO to take supervisory and/or enforcement actions based on the degree to which an enterprise is undercapitalized. See 12 U.S.C. §§ 4614–4636 (2000).

Appendix II: The Business of the Enterprises

As table 2 shows, most of the enterprises' on-balance sheet assets are mortgages. The table also shows that most of the mortgage and other on-balance sheet financial activities of the enterprises are funded by debt.

Table 2: Selected Enterprise On-Balance Sheet Holdings and Liabilities as of December 31, 2001

Dollars in millions		
Item	Fannie Mae	Freddie Mac
Retained mortgage portfolio, net	\$705,167	\$491,719
Total assets	799,791	617,340
Debt, net	763,467	561,946
Total liabilities	781,673	601,967
Stockholders equity capital	18,118	15,373

Sources: Enterprise Investor/Analyst Reports.

Each enterprise's total mortgage portfolio (see table 3) consists of on-balance sheet mortgages and mortgage-backed securities (MBS) held by the enterprises, and off-balance sheet MBS owned by investors who receive their interest and principal from a pool of mortgages. At the end of 2001, Fannie Mae's total mortgage portfolio was \$1.56 trillion, and Freddie Mac's was \$1.14 trillion. A majority of the enterprises' holdings consisted of off-balance sheet MBS pools. Over time, both enterprises have shifted a greater share of their mortgage assets on book, increasing their interest rate risk.

Table 3: Total Mortgage Portfolio of the Enterprises, Year-End 2001

Dollars in millions		
Item	Fannie Mae	Freddie Mac
Mortgage assets, including MBS, on the balance sheet	\$705,167	\$491,719
Mortgage-backed securities held by the public	858,867	646,448
Total mortgage portfolio	1,564,034	1,138,167

Source: Enterprise Investor/Analyst Reports.

The enterprises' income and expenses reflect their basic operations. Fannie Mae's 2001 net income was \$5.9 billion and Freddie Mac's \$4.1 billion, largely from net interest and fee income (see table 4). Mortgages and MBS owned by the enterprises generated net interest income of \$8.1

billion for Fannie Mae and \$5.5 billion for Freddie Mac, while investor-owned MBS generated fee income that totaled about \$1.6 billion for each enterprise. Actual and estimated expenses related to credit risk were \$77.7 million for Fannie Mae and \$84 million for Freddie Mac, while administrative expenses were about 17 percent of net income for both enterprises.

Table 4: Selected Data on Enterprise Income and Expenses for the year ending December 31, 2001

Dollars in millions		
Item	Fannie Mae	Freddie Mac
Net income	\$5,894.1	\$4,147
Guarantee fees and other fee income	1,633.4	1,639
Net interest income	8,090.1	5,480
Provision for losses	115	(45)
Estimated losses due to foreclosures	(192.7)	(39)
Administrative expenses	(1,017.6)	(844)

Source: Enterprise Investor/Analyst Reports.

Appendix III: Comments from Freddie Mac

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June 3, 2002



Mr. Thomas J. McCool
Managing Director
Financial Markets and Community Investment
U.S. General Accounting Office
Washington, DC 20410

Dear Mr. McCool:

Thank you for giving us the opportunity to review GAO's draft report, *OFHEO's Risk-Based Capital Stress Test: Incorporating New Business Is Not Advisable*. We also appreciate the opportunity to meet with GAO staff during their preparation of the report to offer our perspective on this issue.

Freddie Mac agrees with GAO's conclusion that the Office of Federal Enterprise Housing Oversight (OFHEO) should not incorporate new business assumptions into its risk-based capital stress test. We agree with GAO that determining the assumptions is inherently speculative and that introducing them would increase the complexity of the stress test and reduce its transparency by making it more difficult to understand. In addition, we agree that supervisory review by OFHEO should work in conjunction with the capital standards to help ensure Freddie Mac's safety and soundness.

Please contact me if you have any questions or if we may be of further assistance.

Sincerely,

A handwritten signature in black ink, appearing to read "Edward Golding".

Edward Golding
Senior Vice President
Housing Economics and Financial Research

Related GAO Products

Federal Home Loan Bank System: Establishment of a New Capital Structure. [GAO-01-873](#). Washington, D.C.: July 20, 2001.

Comparison of Financial Institution Regulators' Enforcement and Prompt Corrective Action Authorities. [GAO-01-322R](#). Washington, D.C.: January 31, 2001.

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Improved Regulatory Structure and Minimum Capital Standards are Needed for Government-Sponsored Enterprises. [GAO/T-GGD-91-41](#). Washington, D.C.: June 11, 1991.

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